

1. A personal video recorder device, comprising:
  - input means receiving a video signal input and producing a live video signal as an output;
  - a disk drive storing a representation of the live video signal input as it is received by the input means and providing as an output a stored video signal;
  - output means for providing a video output signal;
  - switching means for routing a signal to the output means;
  - control means for controlling the switching means; and
  - wherein the control means receives user commands and responsive to a user command to change a channel, commands the switching means to route the live video signal to the output means.
2. The apparatus according to claim 1, wherein the input means comprises a tuner.
3. The apparatus according to claim 2, wherein the input means further comprises an analog to digital converter.
4. The apparatus according to claim 2, wherein the input means further comprises a demultiplexer.
5. The apparatus according to claim 1, wherein the output means comprises a modulator.
6. The apparatus according to claim 1, wherein the output means comprises a digital video formatter.
7. The apparatus according to claim 1, wherein the output means provides the output signal formatted as one of NTSC, PAL, DVI and MPEG.

1 8. The apparatus according to claim 1, wherein the output means further  
2 comprises a digital to analog converter receiving the stored video signal and  
3 converting the stored video signal to an analog form.  
4

5 9. The apparatus according to claim 1, wherein the input means comprises a  
6 tuner and the output means comprises a modulator, and wherein the live video  
7 signal is routed by the switching means from the tuner to the modulator.  
8

9 10. The apparatus according to claim 1, wherein the input means comprises a  
10 tuner and an analog to digital converter;

11 wherein the output means comprises a digital to analog converter and a  
12 modulator; and

13 wherein the live video signal is routed by the switching means from the  
14 analog to digital converter to the digital to analog converter.  
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16 11. The apparatus according to claim 1, wherein the input means comprises a  
17 tuner and a demultiplexer;

18 wherein the output means comprises a digital data formatter; and

19 wherein the live video signal is routed by the switching means from the  
20 demultiplexer to the digital data formatter.  
21

22 12. The apparatus according to claim 1, wherein responsive to a user command  
23 to implement an effect using the disk drive, the control means commands the  
24 switching means to route the stored video signal to the output means.  
25

26 13. The apparatus according to claim 12, wherein the effect comprises a live  
27 pause effect.

1 14. A personal video recorder device, comprising:  
2 input means receiving a video signal input and producing a live video signal  
3 as an output;  
4 a disk drive storing a representation of the live video signal input as it is  
5 received by the input means and providing as an output a stored video signal;  
6 output means for providing a video output signal;  
7 switching means for routing a signal to the output means;  
8 control means for controlling the switching means; and  
9 wherein the control means receives user commands and responsive to a  
10 user command to implement an effect using the disk drive, commands the  
11 switching means to route the stored video signal to the output means.  
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13 15. The apparatus according to claim 14, wherein the input means comprises  
14 a tuner.  
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16 16. The apparatus according to claim 15, wherein the input means further  
17 comprises an analog to digital converter.  
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19 17. The apparatus according to claim 15, wherein the input means further  
20 comprises a demultiplexer.  
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22 18. The apparatus according to claim 14, wherein the output means comprises  
23 a modulator.  
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25 19. The apparatus according to claim 14, wherein the output means comprises  
26 a digital video formatter.  
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28 20. The apparatus according to claim 14, wherein the output means provides the  
29 output signal formatted as one of NTSC, PAL, DVI and MPEG.  
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1 21. The apparatus according to claim 14, wherein the output means further  
2 comprises a digital to analog converter receiving the stored video signal and  
3 converting the stored video signal to an analog form.  
4

5 22. The apparatus according to claim 14, wherein the input means comprises  
6 a tuner and the output means comprises a modulator, and wherein the live video  
7 signal is routed by the switching means from the tuner to the modulator.  
8

9 23. The apparatus according to claim 14, wherein the input means comprises  
10 a tuner and an analog to digital converter;

11 wherein the output means comprises a digital to analog converter and a  
12 modulator; and

13 wherein the live video signal is routed by the switching means from the  
14 analog to digital converter to the digital to analog converter.  
15

16 24. The apparatus according to claim 14, wherein the input means comprises  
17 a tuner and a demultiplexer;

18 wherein the output means comprises a digital data formatter; and

19 wherein the live video signal is routed by the switching means from the  
20 demultiplexer to the digital data formatter.  
21

22 25. The apparatus according to claim 14, wherein responsive to a user  
23 command to change a channel, the control means commands the switching  
24 means to route the live video signal to the output means.  
25

26 26. The apparatus according to claim 14, wherein the effect comprises a live  
27 pause effect.  
28

- 1        27.    A personal video recorder device, comprising:  
2            a tuner receiving a video signal input and producing a live video signal as an  
3            output;  
4            an analog to digital converter receiving the live video signal and converting  
5            it to a digital live video signal;  
6            a disk drive receiving and storing the digital live video signal input as it is  
7            produced by the analog to digital converter and providing as an output a stored  
8            digital video signal;  
9            a digital to analog converter receiving the stored digital video signal and  
10           producing an analog video signal;  
11           an output circuit that provides an output signal suitable for display on a video  
12           display;  
13           a switch that routes a signal to the output circuit;  
14           a controller that directs the switch to provide one of the live video signal and  
15           the analog video signal to the output circuit; and  
16           wherein the controller receives user commands and responsive to a user  
17           command to change a channel, commands the switch to route the live video signal  
18           to the output circuit.
- 19  
20        28.    The apparatus according to claim 27, wherein the output circuit comprises  
21           a modulator.
- 22  
23        29.    The apparatus according to claim 27, wherein the output circuit provides the  
24           output signal formatted as one of NTSC, PAL, DVI and MPEG.
- 25  
26        30.    The apparatus according to claim 27, wherein responsive to a user  
27           command to implement an effect using the disk drive, the controller commands the  
28           switch to route the analog video signal to the output circuit.
- 29

1 31. The apparatus according to claim 30, wherein the effect comprises a live  
2 pause effect.

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1        32.    A personal video recorder device, comprising:  
2            a tuner receiving a video signal input and producing a live video signal as an  
3            output;  
4            an analog to digital converter receiving the live video signal and converting  
5            it to a digital live video signal;  
6            a disk drive receiving and storing the digital live video signal input as it is  
7            produced by the analog to digital converter and providing as an output a stored  
8            digital video signal;  
9            a digital to analog converter receiving the stored digital video signal and  
10          producing an analog video signal;  
11          an output circuit that provides an output signal formatted for display on a  
12          video display;  
13          a switch that routes a signal to the digital to analog converter;  
14          a controller that directs the switch to provide one of the digital live video  
15          signal and the stored digital video signal to the digital to analog converter; and  
16          wherein the controller receives user commands and responsive to a user  
17          command to change a channel, commands the switch to route the digital live video  
18          signal to the digital to analog converter.

19  
20        33.    The apparatus according to claim 32, wherein the output circuit comprises  
21        a modulator.

22  
23        34.    The apparatus according to claim 32, wherein the output circuit provides the  
24        output signal formatted as one of NTSC, PAL, DVI and MPEG.

25  
26        35.    The apparatus according to claim 32, wherein responsive to a user  
27        command to implement an effect using the disk drive, the controller commands the  
28        switch to route the stored digital video signal to the digital to analog converter.  
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1 36. The apparatus according to claim 35, wherein the effect comprises a live  
2 pause effect.  
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1 37. A personal video recorder device, comprising:  
2 a tuner receiving a video signal input and producing a live video signal as an  
3 output;  
4 an analog to digital converter receiving the live video signal and converting  
5 it to a digital live video signal;  
6 a disk drive receiving and storing the digital live video signal input as it is  
7 produced by the analog to digital converter and providing as an output a stored  
8 digital video signal;  
9 a digital to analog converter receiving the stored digital video signal and  
10 producing an analog video signal;  
11 an output circuit that provides an output signal to a video display;  
12 a switch that routes a signal to the digital to analog converter;  
13 a controller that directs the switch to route one of the digital live video signal  
14 and the stored digital video signal to the digital to analog converter; and  
15 wherein the controller receives user commands and responsive to a user  
16 command to implement an effect using the disk drive, the controller commands the  
17 switch to route the stored digital video signal to the digital to analog converter.

18  
19 38. The apparatus according to claim 37, wherein the output circuit comprises  
20 a modulator.  
21

22 39. The apparatus according to claim 37, wherein the output circuit provides the  
23 output signal formatted as one of NTSC, PAL, DVI and MPEG.  
24

25 40. The apparatus according to claim 37, wherein responsive to a user  
26 command change a channel, the controller commands the switch to route the  
27 digital live video signal to the digital to analog converter.  
28

29 41. The apparatus according to claim 40, wherein the effect comprises a live  
30 pause effect.

1 42. A personal video recorder device, comprising:  
2 input circuit receiving a video signal input and producing a live video signal  
3 as an output;  
4 a disk drive storing a representation of the live video signal input as it is  
5 received by the input circuit and providing as an output a stored video signal;  
6 an output circuit that provides an output signal suitable for driving a video  
7 display;  
8 switching means for routing a signal to the output circuit;  
9 control means for controlling the switching means; and  
10 wherein the control means receives user commands and responsive to a  
11 user commands ~~operates~~ operates the switching means in one of a live video output mode  
12 and a delayed video output mode, wherein in the delayed video output mode the  
13 switching means routes a signal to the output circuit by retrieval of the stored video  
14 signal and wherein in the live video output mode the switching means routes a  
15 signal to the output circuit without storage and retrieval in the disk drive.

16  
17 43. The apparatus according to claim 42, wherein responsive to a command to  
18 change a channel, the control means controls the switching means to operate in  
19 the live video output mode.

20  
21 44. The apparatus according to claim 42, wherein responsive to a command to  
22 implement an effect using the disk drive, the control means controls the switching  
23 means to operate in the delayed video output mode.

24  
25 45. The apparatus according to claim 44, wherein the effect comprises a live  
26 pause effect.  
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1 46. A personal video recorder device, comprising:  
2 a tuner receiving a video signal input and producing a video transport stream  
3 as an output;  
4 a demultiplexer receiving the transport stream and extracting digital live video  
5 signal therefrom;  
6 a disk drive receiving and storing the digital live video signal input from the  
7 demultiplexer and providing as an output a stored digital video signal;  
8 an output circuit that provides an output signal suitable for display on a video  
9 display;  
10 a switch that routes a signal to the output circuit;  
11 a controller that directs the switch to provide one of the digital live video  
12 signal and the stored digital video signal to the output circuit; and  
13 wherein the controller receives user commands and responsive to a user  
14 command to change a channel, commands the switch to route the live digital video  
15 signal to the output circuit.

16  
17 47. The apparatus according to claim 46, wherein the output circuit comprises  
18 one of a digital data formatter and a modulator.

19  
20 48. The apparatus according to claim 46, wherein the output circuit provides the  
21 output signal formatted as one of NTSC, PAL, DVI and MPEG.

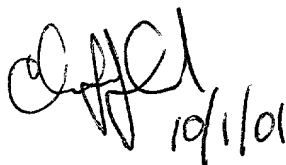
22  
23 49. The apparatus according to claim 46, wherein responsive to a user  
24 command to implement an effect using the disk drive, the controller commands the  
25 switch to route the stored digital video signal to the output circuit.  
26

1 50. A personal video recorder device, comprising:  
2 a tuner receiving a video signal input and producing a video transport stream  
3 as an output;  
4 a demultiplexer receiving the transport stream and extracting digital live video  
5 signal therefrom;  
6 a disk drive receiving and storing the digital live video signal input from the  
7 demultiplexer and providing as an output a stored digital video signal;  
8 an output circuit that provides an output signal suitable for display on a video  
9 display;  
10 a switch that routes a signal to the output circuit;  
11 a controller that directs the switch to provide one of the digital live video  
12 signal and the stored digital video signal to the output circuit; and  
13 wherein the controller receives user commands and responsive to a user  
14 command to implement an effect using the disk drive, the controller commands the  
15 switch to route the stored digital video signal to the output circuit.

16  
17 51. The apparatus according to claim 50, wherein the output circuit comprises  
18 one of a digital data formatter and a modulator.

19  
20 52. The apparatus according to claim 50, wherein the output circuit provides the  
21 output signal formatted as one of NTSC, PAL, DVI and MPEG.

22  
23 53. The apparatus according to claim 50, wherein responsive to a user  
24 command to ~~implement an effect using the disk drive, the controller commands the~~  
25 ~~switch to route the stored digital video signal to the output circuit.~~  
26 change a channel, the controller commands the switch to route  
27 the ~~live~~ digital live video signal to the output circuit.

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1 54. A method of controlling operation of a personal video recorder (PVR),  
2 comprising:

3 receiving an input signal from a video source;

4 storing a representation of the video signal on a hard disk drive;

5 providing a video output signal;

6 controlling a source of the output signal by determining if a channel change  
7 command has been issued, wherein:

8 if a channel change command has not been issued, selecting the  
9 source of the output signal to be from the hard disk drive; and

10 if a channel change command has been issued, selecting the source  
11 of the output signal to be from a source prior to the hard disk drive so that  
12 the source of the output signal is not delayed by storage to and retrieval from  
13 the hard disk drive.  
14

15 55. The method according to claim 54, further comprising:

16 controlling a source of the output signal by determining if an effect command  
17 has been issued, wherein:

18 if an effect command has been issued, selecting the source of the  
19 output signal to be from the hard disk drive; and

20 if an effect command has not been issued, selecting the source of the  
21 output signal to be from a source prior to the hard disk drive so that the  
22 source of the output signal is not delayed by storage to and retrieval from the  
23 hard disk drive.  
24

25 56. The method according to claim 55, wherein the effect comprises a live  
26 pause effect.  
27

28 57. An electronic storage medium storing instructions that when executed on a  
29 programmed processor carry out the method according to claim 54.

1 58. A method of controlling operation of a personal video recorder (PVR),  
2 comprising:

3 receiving an input signal from a video source;

4 storing a representation of the video signal on a hard disk drive;

5 providing a video output signal;

6 controlling a source of the output signal by determining if an effect command  
7 has been issued, wherein:

8 if an effect command has been issued, selecting the source of the  
9 output signal to be from the hard disk drive; and

10 if an effect command has been issued, selecting the source of the  
11 output signal to be from a source prior to the hard disk drive so that the  
12 source of the output signal is not delayed by storage to and retrieval from the  
13 hard disk drive.

14  
15 59. The method according to claim 58, wherein the effect comprises a live  
16 pause effect.

17  
18 60. An electronic storage medium storing instructions that when executed on a  
19 programmed processor carry out the method according to claim 58.

1        61.    A method of controlling operation of a personal video recorder, comprising:  
2            at a tuner, receiving an input signal containing television programming;  
3            storing a digital representation of the television programming to a storage  
4            medium;            retrieving the digital representation from the storage medium;  
5            presenting the retrieved digital representation to an output in a format  
6            suitable for display on a television display; and  
7            receiving a channel change command, and in response thereto presenting  
8            a representation of the television programming received at the tuner to the output  
9            without the storing and retrieving.

10  
11        62.    The method according to claim 61, further comprising receiving an effect  
12        command, and in response thereto presenting the retrieved digital representation  
13        to the output.

14  
15        63.    The method according to claim 62, wherein the effect comprises a live  
16        pause effect.

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18        64.    An electronic storage medium storing instructions that when executed on a  
19        programmed processor carry out the method according to claim 61.  
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1 65. A method of controlling operation of a personal video recorder, comprising:  
2 at a tuner, receiving an input signal containing television programming;  
3 storing a digital representation of the television programming to a storage  
4 medium;  
5 sending a representation of the input signal to an output formatted for display  
6 on a display as live video; and  
7 receiving an effect command, and in response thereto retrieving the digital  
8 representation from the storage medium and presenting the retrieved digital  
9 representation to the output as delayed video.

10  
11 66. The method according to claim 65, further comprising receiving a channel  
12 change command, and in response thereto presenting a representation of the  
13 television programming received at the tuner to the output without the storing and  
14 retrieving.

15  
16 67. The method according to claim 65, wherein the effect comprises a live  
17 pause effect.

18  
19 68. An electronic storage medium storing instructions that when executed on a  
20 programmed processor carry out the method according to claim ~~68~~.  
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